



Exploration & Production

GENERAL SPECIFICATION

HVAC

GS EP HVA 218

Coalescer Filter(s)

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00	10/2005	First issue
Rev.	Date	Notes



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1. Scope

The purpose of this document is to define the minimum requirements for design, construction and supply of coalescer filter(s).

The words and expressions in capital characters are defined inside the general specification **GS EP HVA 801**.

When other words require a definition only for using within that document, the definition is given in a paragraph of that document and the defined word is marked in small and *italic* letters.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Equipment and installations must be in accordance with (in order of precedence):

1. The country local regulations where equipment and/or installations shall be operated
2. Total General Specifications as listed in **GS EP HVA 000**
3. The International Standards
4. The French Regulation (when Country local regulation does not exist).

Notes:

- In case of discrepancy between documents the more stringent requirements shall apply.
- The HVAC VENDOR or CONTRACTOR may propose proven improvements to the reference documents but shall obtain written approval of the COMPANY prior to implementation.
- An International Standard is a good "engineering practice" which shall be recognised and taken into consideration by VENDOR, SUPPLIER, MANUFACTURER and/or CONTRACTOR. If required, the translation of the standards must be included into HVAC scope.
- The latest revision of Standards, codes, regulations and the published errata if any must be used and applied by VENDOR, SUPPLIER, MANUFACTURER and CONTRACTOR.

Standards

Reference	Title
EN 779	Particulate air filters for general ventilation - Determination of the filtration performance
EN 10204	Metallic materials - Types of inspection documents
ISO 9606-1	Qualification test of welders - Fusion welding - Part 1: Steels
ISO 9606-2	Qualification test of welders - Fusion welding - Part 2: Aluminium and aluminium alloys

Professional Documents

Reference	Title
SMACNA	Sheet Metal and Air Conditioning CONTRACTORS' National Association

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
SI	International System of Units

Total General Specifications

Reference	Title
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP HVA 000	List of HVAC Specifications
GS EP HVA 100	Basis of design
GS EP HVA 801	Terminology, definitions, abbreviations

3. Definitions

Frame: Installation frame of the coalescer filter that is bolted to cover the bulkhead opening.

Vane: A metallic sheet especially profiled to extract water from the air passing through the coalescer filter.

Height: vertical dimension of the bulkhead opening into which the coalescer filter is to be installed.

Width: horizontal dimension of the bulkhead opening into which the coalescer filter is to be installed.

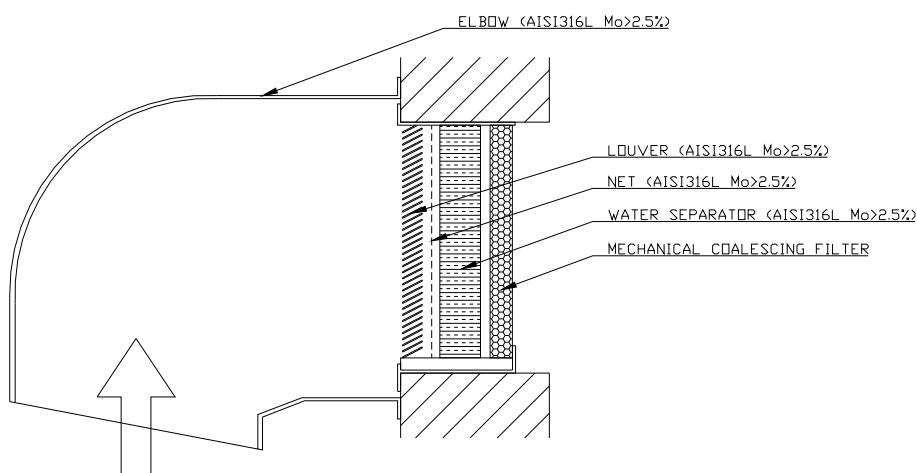
4. Operation

Coalescer filters shall be used to separate moisture, salt spray, rainwater and dust from intake air in HVAC systems and engine rooms. Coalescer filter vane's spray removal performance shall be at least greater than 99% with 13 micron spray. With G4 coalescing filter the total performance shall be at least greater 99.5% with 5 micron spray. The water removal capacity shall be at least 18 l/min/m².

5. Installation

Coalescer filter shall be installed in a vertical position only.

An elbow shall be fitted upstream the coalescer filter along with louver and net as indicated below.



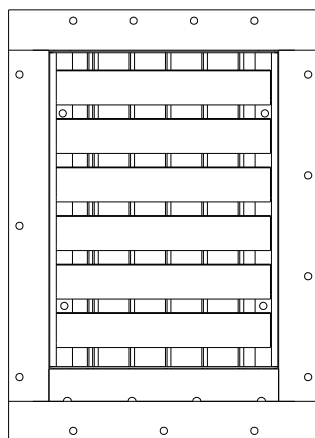
6. Construction

Coalescer filter installation frame, water separator vanes, mechanical coalescing filter, isolation washer and bolts shall be made from stainless steel (AISI 316, Mo > 2.5%).

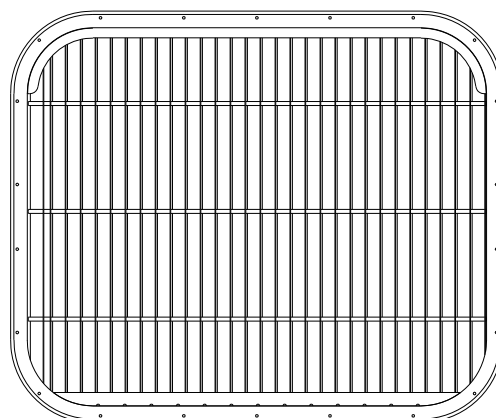
Mechanical coalescing filter shall be G4 class ([EN 779](#)).

6.1 Installation Frame

Installation frames with squared, and round corners can be accepted. *Frame* shall be constructed to either remove the separated water through front of the frame or into a drainpipe.



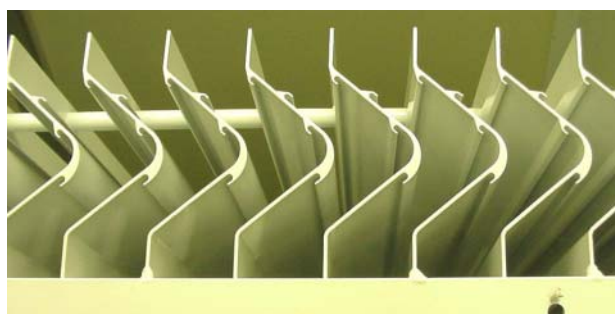
Squared installation frame



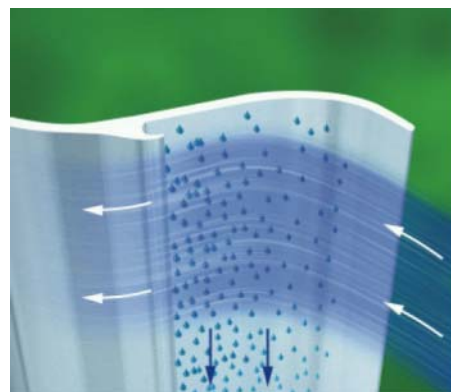
Round cornered installation frame (without louver)

6.2 Water separator vanes

The shape of the vanes shall provide a low pressure drop and high separation efficiency.



Vane profile



Operation principle of the vanes

6.3 Mechanical coalescing Filter

In two stage coalescer filter the mechanical coalescing filter must be installed downstream the water separator vanes.

The G4 filter material is microbiologically inactive and corrosion-free.

Technical data (typical):

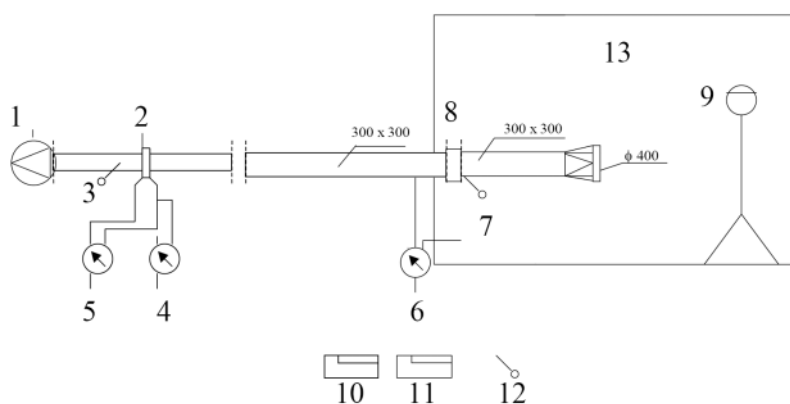
Filter Class according to EN 779	G4
Dimensions of 1/1 element WxH (mm)	595x595
Depth (mm)	330 / 510
Nominal volume flow rate (m ³ /h)	3,600
Initial pressure drop (Pa)	45 / 30
Average arrestance (%)	90 / 92
Filtering area (m ²)	2.0 / 3.0

Dust holding capacity (g)	400 / 600
Thermal stability (peak) (°C)	70 (80)
Moisture resistance (%)	100

7. Performances

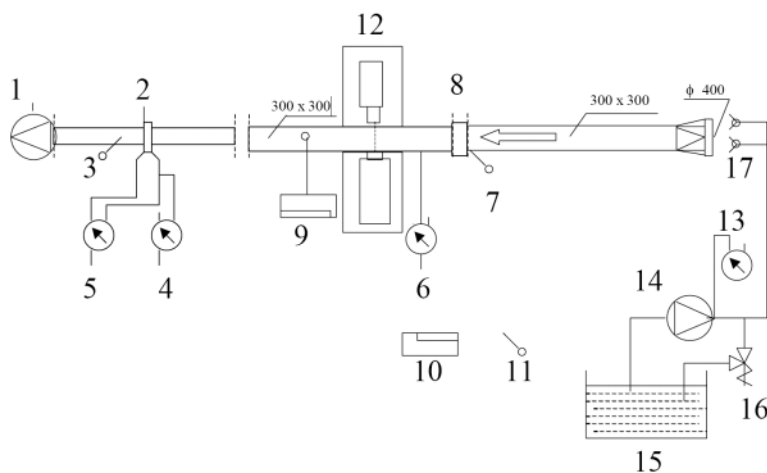
7.1 Performances for Water Separator vanes (Stainless steel)

7.1.1 Test setup in aerodynamic and noise measurements



1. Fan
2. Orifice plate
3. Air temperature at orifice plate
4. Orifice plate static pressure manometer
5. Orifice plate differential pressure manometer
6. Device static pressure manometer
7. Air temperature at Water Separator
8. Water Separator
9. Microphone
10. Ambient pressure
11. Ambient air relative humidity
12. Ambient air temperature
13. Reverberation room, 300 m³

7.1.2 Test setup in water droplet removal measurements



1. Fan
2. Orifice plate
3. Air temperature at orifice plate
4. Orifice plate static pressure manometer
5. Orifice plate differential pressure manometer
6. Device static pressure manometer
7. Air temperature at Water Separator
8. Water Separator
9. Humidity sensor
10. Ambient pressure
11. Ambient air temperature
12. Droplet size analyzer (Malven 2600c)
13. Water spray pressure gauge
14. High pressure pump
15. Water container
16. Spray pressure adjustment valve
17. Spray nozzles

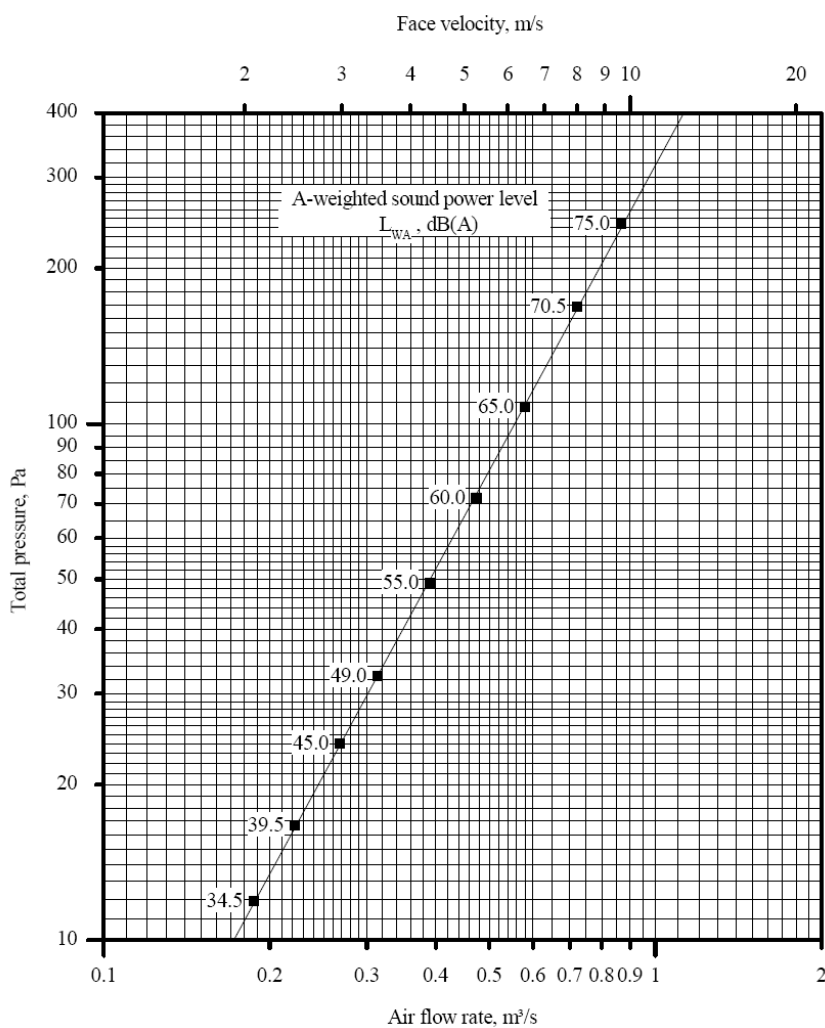
7.1.3 Aerodynamic and noise performance results

Face dimensions: 300x300 mm

Vane distance: 30 mm

Vane material: AISI 316

Air density: 1.20 kg/m³



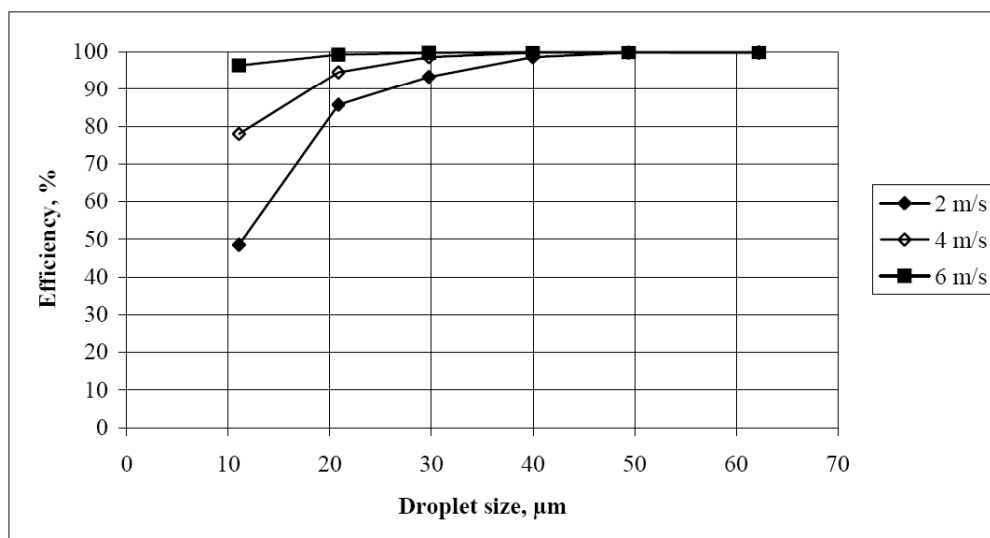
7.1.4 Efficiency for droplet removal

Vane distance: 30 mm

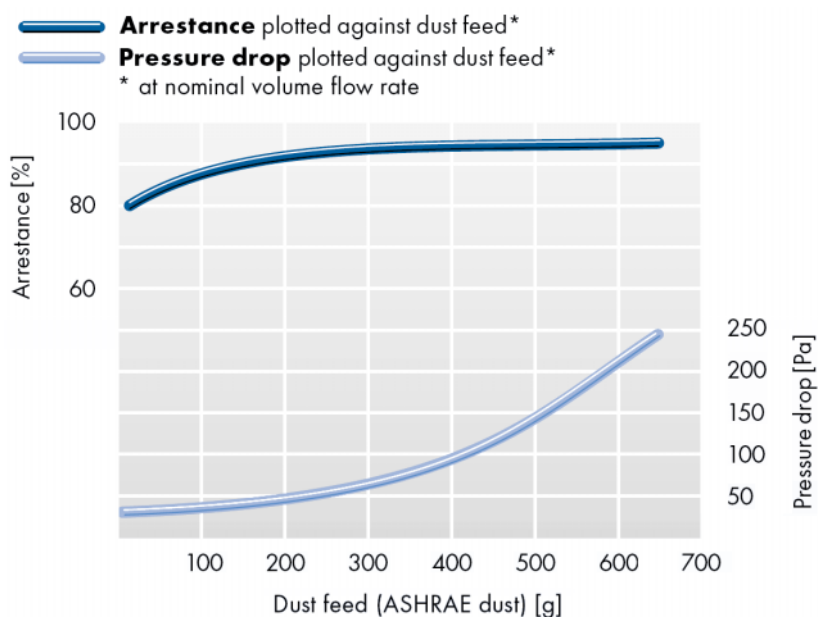
Vane material: AISI 316

Droplet size, μm		Efficiency, %		
Size range	Average	Air flow velocity, m/s		
		2	4	6 ^{*)}
5.8 - 16.3	11.1	48.6	77.9	96.4
16.3 - 25.4	20.9	85.7	94.5	99.3
25.4 - 34.1	29.8	93.3	98.6	99.8
34.1 - 45.9	40.0	98.6	99.9	100.0
45.9 - 53.0	49.4	99.8	99.9	100.0
53.0 - 71.5	62.3	99.9	99.8	100.0

*) Because of high efficiency the downstream water concentration is too low for accurate measurement. The results are informative.



7.2 Performances for G4 mechanical coalescing filter



Initial pressure drop curves

